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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER	
SLOAN, NATHAN A	
ART UNIT	PAPER NUMBER
2614	4

DATE MAILED: 07/17/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/589,142	MASUDA ET AL.	
	Examiner	**Art Unit**	
	Nathan A Sloan	2614	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE _3_ MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on _07 June 2000_ .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) _1-15_ is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) _1-15_ is/are rejected.

7)☒ Claim(s) _8 and 12_ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on _07 June 2000_ is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Claim Objections

1. Claims 8 and 12 are objected to because of the following informalities: it appears applicant intended – predetermined threshold – instead of "predetermine threshold." Appropriate correction is required.

Drawings

2. The drawings are objected to because item 44 of Figure 4 is been spelled "variabel amplifier" when it appears applicant intended –variable amplifier--. A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

3. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference sign(s) not mentioned in the description: item 124 of Figure 12. It appears applicant intended item 124 as 124_1, see pages 23-24 of the specification. A proposed drawing correction, corrected drawings, or amendment to the specification to add the reference sign(s) in the description, are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1-5, 7, and 9 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by Curry et al. (3,750,022).

Curry et al. teach a system for minimizing upstream noise in a subscriber response cable television system using attenuation and variable gain amplifiers.

With respect to claim 1, the claimed system for reducing noise in a signal line with bi-directional communication between a center and terminals is met by Curry with reference to Figure 1. The claimed "noise reduction device, provided between the center and the terminals, which attenuates the upward signals by an increased amount when a noise increase regarding upward signals is detected on the signal line" is met by line control circuit 27, containing phantom subscriber 29, which instructs switchable attenuators 35 to control attenuation of a signal (col. 5, lines 5-10) based on an increase of noise in upstream signals as detected by noise measuring equipment 25 (col. 3, lines 34-41.) The claimed "noise control device, provided at terminals, which boosts a transmission level of the upward signals by an amount compensating for the attenuation of the upward signals by said noise-reduction device" is met by phantom

subscriber 39, which is operative to instruct line amplifier 43 at line control unit 38 (claimed terminal) to boost transmission levels. As taught in column 9, lines 46-58, line amplifier 43 operates under control of phantom subscriber 39 to boost a transmission level in response to commands from LPC 16 detecting an increased upstream noise level. The signal then passes through switchable attenuator 35 which lies between amplifier 43 and the head end (see Figure 5).

With respect to claim 2, the claimed noise-reduction device including a noise-level-check unit for comparing an obtained signal component and a noise component and detecting a noise increase based on the comparison is met by Curry with the system for minimizing noise noted above. Noise measuring equipment 25 operates to separate noise from a signal component and determine an amount of existing noise in upstream transmissions. As is well known and taught in column 9, lines 3-8, a signal to noise ratio is determined during this process. In the system of Curry, an increased noise is generally detected at the head end with respect to a signal threshold and a comparison is made to "detect a noise increase" as taught in column 3, lines 34-41. However, in column 20, lines 15-30 Curry teaches that noise measurements may be made at the phantom subscriber 29. Therefore, the noise measuring equipment 25 at head end 13 in Figure 1, claimed noise level check unit, may also be provided within line control device 27, claimed noise-reduction device. A switchable attenuator 35 (Fig. 5) is provided to attenuate upstream signals "if an increase in upward noise is detected." Furthermore, as taught in column 20, lines 21-24 this noise detection may be transmitted upstream to headend 13. Headend 13 may then transmit a tone control signal via "downward signals" as claimed (col. 3, lines 59-65).

With respect to claim 3, the claimed noise-control-device including a tone-detection unit which detects the tone signal is met by phantom subscriber 39 which as noted in response to claim 1 operates in response to instructions from LPC 16 to vary amplifier gain in the presence of noise. Command register 213 of Figure 10 registers commands from control signals, which are taught to optionally be tonal in column 3, lines 59-65. The claimed "variable amplifier to boost amplification of upward signals by an amount compensating for the attenuation of the upward signals by said attenuator" is met as noted above by variable amplifier 43 which increases gain by substantially the same amount as the signal is attenuated, taught in column 9, lines 46-58.

With respect to claim 4, the claimed "one or more noise reduction devices … are provided in one or more of a two-way amplification unit and splitter units provided between the center and the terminals" is met by phantom subscriber unit 29 and switchable attenuator 35 being provided within line control unit 27, which as seen in Figure 3 includes switching units 111, 113 … and filters 106, 107 … as well as amplifiers 137 and 139 which constitute a "bi-directional amplification unit" as claimed.

With respect to claim 5, the claimed boosting transmission levels by an amount "compensating for a total attenuation of the upward signals of all of said one or more noise-reduction devices" is met as noted above by boosting signals using variable amplifier 43, taught in column 9, lines 46-58 to increase gain by substantially the same amount as the signal is attenuated.

With respect to claim 7, the obtaining of a level of a signal component is met as noted above by detecting a noise level with noise measuring equipment 25. As is well known and

taught in column 9, lines 3-8, a signal to noise ratio is determined during this process. As taught in column 3, lines 59-65 an upper pilot tone may be inserted for testing or control purposes into the 116 to 120MHz band, meeting the claimed high frequency signal included within a frequency range and command register 213 of Figure 10 registers commands from control signals. The claimed subtraction unit is not explicitly taught by Curry, however, it is the position of the examiner that this feature is inherent to obtaining a noise level from an upstream signal. To further support this, as seen in columns 9-10 numerous mathematical operations including subtraction to obtain signal levels are performed. Noise measuring equipment 25 is also taught to compare a noise level with a threshold or "reference level" and detect a noise increase based on the comparison in column 3, lines 34-42.

With respect to claim 9, the claimed "device for reducing noise in a communication system having a signal line, through which upward signals and downward signals are transmitted' is met by Headend site 13 of Figure 1, which includes Local Processing Center (LPC) 16 and is taught to have bi-directional communication signals passed through it in column 3, lines 23-26. LPC 16 is used to control noise measuring equipment 25, which monitors upstream transmissions and measures levels of noise by comparison to a threshold (col. 3, lines 34-42). As is well known and taught in column 9, lines 3-8, a signal to noise ratio is determined during this process and used to detect noise. To these means, the claimed "noise-level-check unit which makes a comparison between a signal component and a noise component that are obtained from a signal line, and detects a noise increase regarding upward signals based on the comparison" is met. The claimed "noise reduction unit which attenuates the upward signals by an increased amount and transmits a tone signal via downward signals if said noise-level-check

unit detects the noise increase" is met by LPC 16 generating a signal to control upstream transmissions and reduce noise using attenuation. This control signal is sent downstream to subscriber units optionally via a pilot tone (col. 3, lines 60-65), as claimed, which causes attenuation of an output signal as taught in column 5, lines 13-18.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 11 and 13-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Curry et al. (3,750,022).

With respect to claims 11 and 14, the obtaining of a level of a signal component is met as noted above by detecting a noise level with noise measuring equipment 25. As is well known and taught in column 9, lines 3-8, a signal to noise ratio is determined during this process. As taught in column 3, lines 59-65 an upper pilot tone may be inserted for testing or control purposes into the 116 to 120MHz band, meeting the claimed high frequency signal included within a frequency range. In the case described above in response to claim 2, if noise measuring equipment 25 is included at line control circuit 27 then the detection of noise may be transmitted upstream to headend 13 (col. 20, lines 15-29). These signals are not taught to be obtained at

head-end within a high-frequency range of the upward signals, however. Nevertheless, both transmission upstream of signal and noise components is taught as well as transmission of downstream tonal signals in a high-frequency range (col. 3, lines 34-42 and 59-65). It therefore would have been obvious for one skilled in the art at the time of the invention to modify the system of Curry by transmitting upward signals as a high-frequency signal in order to easily distinguish system diagnostics from subscriber communications. Furthermore, the claimed subtraction unit is not explicitly taught by Curry; however, it is the position of the examiner that this feature is inherent to obtaining a noise level from an upstream signal. To further support this, as seen in columns 9-10 numerous mathematical operations including subtraction to obtain signal levels are performed. Noise measuring equipment 25 is also taught to compare a noise level with a threshold or "reference level" and detect a noise increase based on the comparison in column 3, lines 34-42.

With respect to claim 13, the claimed filters for separating downward and upward signals are met by Curry as seen in Figure 3 with filters 105, 106, 107, and 109. Curry also teaches that LPC 16 may insert tone control signals into a downward signal as taught in column 3, lines 59-65. These control signals are sent in response to detection of noise by noise measuring device 25 as noted above thus meeting a "tone-signal-transmission unit which inserts the tone signal into the downward signals in response to the control signal indicating the detection of the noise increase." The claimed variable attenuator is met as seen in Figure 5 at item 35, which "attenuates the upward signals by the increased amount in response to a control signal from said noise-level-check unit indicating a detection of the noise increase" as taught in column 3, lines 34-41 and column 9, lines 52-58. This attenuator is not shown to be part of LPC 16, claimed

noise-reduction unit; however, increased functionality local to attenuator 35 is taught in column 20, lines 15-35 by allowing phantom subscribers to detect noise, control amplification in their respective localities, and notify head end 13 of detected noise. It clearly then would have been obvious for one skilled in the art at the time of the invention to provide noise detection and attenuation as part of the phantom subscribers which contain attenuator 35 in order to allow local control of gain and reduce the system processing load at head-end 13.

With respect to claim 15, inclusion of positional information is met by insertion of addressing data into control signals as taught in column 11, lines 5-10, which may be tonal as noted above.

5. Claims 6, 8, 10, and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Curry et al. (3,750,022) in view of Schwartzman et al. (6,385,773).

Schwartzman teaches a system and method for determining an optimum upstream frequency channel based on noise and bit-error-rate assessments.

With respect to claim 6, the claimed noise-reduction device comprising a unit for "obtaining a level of a signal component demodulated through coherent detection of the upward signals" is taught by Curry with line control circuit 27 that may include a unit for sampling noise (col. 20, lines 15-30) to monitor and measure noise in a conventional manner (col. 3, lines 34-42). As is well known and taught in column 9, lines 3-8, a signal to noise ratio is determined during this process to determine a measure of noise. Curry fails to teach obtaining a level of noise "through detection of noises observed on the signal line during a time period when no signal component is present." Schwartzman teaches in column 11, lines 38-51 determining an intrinsic power level as a measure of the noise level at a time when no data or signal is being

transmitted. Schwartzman also teaches comparison of a signal level to the level of a noise component as seen with reference to Figure 4, particularly step 408. It would have been obvious for one skilled in the art at the time of the invention to modify the system of Curry by monitoring a base noise measurement as taught by Schwartzman in order to ensure "a high rate of data integrity" as taught by Schwartzman in column 7, lines 57-58.

With respect to claim 8, the claimed noise-reduction device comprising a unit for "obtaining a level of a signal component demodulated through coherent detection of the upward signals" is not explicitly taught by Curry. As previously noted however, line control circuit 27 may include a unit for sampling noise which is taught in column 3, lines 34-42 to monitor and measure noise in a conventional manner. As is well known and taught in column 9, lines 3-8, a signal to noise ratio is determined during this process. The operation as a subtraction unit is met as noted in response to claim 7 above. As taught in column 3, lines 59-65 control information may be sent in a high frequency band using an upper pilot tone to control upstream transmission and minimize upstream noise (col. 3, lines 37-41). Line control circuit 27 detect command signals, which may be high frequency tonal signals as noted above, and stores them within command register 213 of Figure 10. These tones, however, are not explicitly taught to be included in "upward signals," rather in the system of Curry these are downward signals. In the case described above in response to claim 2, if noise measuring equipment 25 is included at line control circuit 27 then the detection of noise may be transmitted upstream to headend 13 (col. 20, lines 15-29), although not explicitly taught via upper frequency tones. Nevertheless, both transmission upstream of signal and noise components is taught as well as transmission of downstream tonal signals in a high-frequency range are taught by Curry (col. 3, lines 34-42 and

59-65). It therefore would have been obvious for one skilled in the art at the time of the invention to modify the system of Curry by transmitting upward signals as a high-frequency signal in order to easily distinguish system diagnostics from subscriber communications. Furthermore, the detected noise is not taught to be obtained "during a time period that is identified as a noise period when the level of the signal component is below a predetermined threshold." As is well known and taught in column 9, lines 3-8, a signal to noise ratio is determined during this process and used to detect noise. Schwartzman teaches in column 11, lines 38-51 determining an intrinsic power level as a measure of the noise level at a time when there is a low power measurement indicating that frequency channels are not transmitting a signal. The specific use of a "threshold" is taught with reference to noise and power determinations in column 9, lines 59-62. It would have been obvious for one skilled in the art at the time of the invention to modify the system of Curry by monitoring a base noise measurement as taught by Schwartzman in order to ensure "a high rate of data integrity" as taught by Schwartzman in column 7, lines 57-58.

With respect to claim 10, the claimed noise-level-check unit including a "unit which obtains a level of a signal component demodulated through coherent detection of the upward signals" is met by noise measuring equipment 25, taught in column 3, lines 34-41 to obtain a noise level and compare to a threshold. As is well known and taught in column 9, lines 3-8, a signal to noise ratio is determined during this process and used to detect noise. The claimed unit which obtains a level of noise "during a time period when no signal is present" is not explicitly taught by Curry. Schwartzman teaches in column 11, lines 38-51 determining an intrinsic power level as a measure of the noise level at a time when no data or signal is being transmitted.

Schwartzman also teaches comparison of a signal level to the level of a noise component as seen with reference to Figure 4, particularly step 408. It would have been obvious for one skilled in the art at the time of the invention to modify the system of Curry by monitoring a base noise measurement as taught by Schwartzman in order to ensure "a high rate of data integrity" as taught by Schwartzman in column 7, lines 57-58.

Claim 12 is met as noted above in response to claim 8 by Curry in view of Schwartzman.

Conclusion

6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Baran et al. (6,049,693) teach an upstream ingress noise blocking filter using tones to attenuate.

Farhan et al. (6,567,987) teach a system digital transmitter with improved noise power ratio using a variable amplifier that adjusts gain and attenuates based on signal samples.

Eldering et al. (5,881,362) teach a method of reducing ingress noise in cable return paths using gain control signals and attenuation with a variable amplifier.

Hart (5,606,725) teach a broadband network with dynamic upstream power level adjustment as a function of bit error rate.

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Nathan A Sloan whose telephone number is (703)305-8143. The examiner can normally be reached on Mon-Fri 7:30am - 6pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John Miller can be reached on (703)305-4795. The fax phone numbers for the organization where this application or proceeding is assigned are (703)308-5399 for regular communications and (703)308-5399 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703)305-4700.

NAS
July 8, 2003

JOHN MILLER
SUPERVISORY PATENT EXAMINER
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